

**CPP-TRS©: On Using Visual Cognitive Symbols
to Enhance Communication Effectiveness N95-15991**

Prof. Graziella Tonfoni, Author of CPP-TRS©
University of Bologna, Istituto di Glottologia
Via Zamboni, 16 - 40126 Bologna, Italy
E-mail: Tonfoni @elet.polimi.it

Abstract

CPP-TRS© (Communicative Positioning Program/Text Representation Systems) by Graziella Tonfoni is a very easy visual language which is based on a system of 12 canvas, 10 signals and 14 symbols. CPP-TRS© is based on the fact that every communicative action is the result of a set of cognitive processes and the whole system is based on the concept that you can enhance communication by visually perceiving text. Based on a very simple syntax, CPP-TRS is capable of representing meaning and intention as well as communicative function visually. Those are precisely invisible aspects of natural language that are most relevant to getting the global meaning of a text. CPP-TRS is an unambiguous, fast and effective system for reinforcing natural language in human-machine interaction systems. It complements natural language by adding certain important elements that are not represented by natural language in itself. These elements include communicative intention and communicative function of the text expressed by the sender, as well as the role the reader—who is the receiver of the text—is supposed to play. The communicative intention and function of a text and the reader's role are invisible in natural language because neither specific words nor punctuation convey them sufficiently and unambiguously; they are therefore non-transparent. As a language, CPP-TRS can be applied to many different fields both in a transparent and non transparent way.

CPP-TRS© (Tonfoni, 1989-1994) is a visual language that can be productively used to carefully identify and visually represent the sender's communicative intention, the text's function as well as the receiver's role. The CPP-TRS system consists of two consistently integrated parts. CPP stands for Communicative Positioning Program, and it is the methodological component of the system. The CPP methodology enables the user to understand how the sender is positioning himself/herself toward communication. It is a complete program that provides visual schemes, models, and tools aimed toward communicating effectively. TRS stands for Text Representation Systems and is the visual language component. It is strictly integrated with the CPP methodology, and is the corresponding way of representing those

cognitive processes and communicative actions, which are being previously identified by CPP. In some ways the sender's communicative intention, the text's function and the receiver's role are more important than words and sentences because they actually control the meaning at a higher level. They are usually apprehended only after processing and interpreting the whole text, which implies time and effort on the receiver's side. In many cases, they are unfortunately missing altogether, because even the writer of the text is not aware of their importance and has no simple means and training to convey them. It also turns out that these elements of text, that are so important in natural language, are also the most difficult to represent in human-machine interaction.

CPP-TRS constitutes a visual representation system that is consistent and not any less significant than the system of punctuation. The punctuation system in written language represents and complements aspects of oral language, such as pauses and intonation, that enable the proper interpretation of texts. There was a time when the punctuation system did not exist, it was actually invented and conventionally accepted to correct the deficiency that occurred when spoken words and sentences were simply written down.

The punctuation system was readily accepted because it was conventionally representing what naturally already existed in oral communication. In written communication pauses and intonation are therefore conveyed by conventional signs such as periods, commas, and question and exclamation marks. These conventional signs have evolved in written language because their antecedents are real. What exists in written language is a complete system of punctuation that is generally shared by all languages, with just some slight variations, that do not compromise the consistency of the overall system.

The CPP-TRS visual language is not any different than the punctuation system since it represents visually those elements, like communicative intention, communicative function and receiver's role, that are invisible but so important. CPP-TRS is both a conventional and natural meta-language that makes explicit from the beginning what otherwise is left to arbitrary interpretation. The fact that a user may make this explicit from the beginning and make it visible is not a constraint to natural language, but a liberating factor. Making language more explicit by adding visual conventions does enhance the final understanding without compromising it.

The punctuation system, among many other things, lets the reader distinguish an interrogative sentence from a declarative one. In a similar way, by reflecting on his/her everyday communicative behavior and being able to identify and use an appropriate visual representation by mastering the CPP-TRS

signals and symbols system, the user will be able to recognize his/her communicative intentions and make them explicit to other users.

In human-machine interaction, CPP-TRS can be defined as a communicative traffic control system aimed toward facilitating message production and delivery by pre-interpreting the messages. Like in a language, by knowing the syntax an infinite number of sentences can be generated, and, based on the syntax, processed and understood in a fast, unambiguous and easy way. CPP-TRS allows the user to generate any kind of message, proceeding from very simple instructions toward more complex explanations. By conveying intention and communicative functions visually, interactions occurring in two different languages at the same time can be extremely facilitated.

Musical notation uses a set of visual symbols to convey the composer's intentions and wishes to those performing or executing a composition. These symbols communicate what the notes written on the staff alone cannot.

Text in CPP-TRS is conceived as a musical composition: the receiver "plays" a text, just as a musician executes a composition. Two kinds of symbols are presented. The first kind characterizes the style or type of text. There are eleven of these symbols and they have names, such as describe, define, explain, and so on. The name of each of these symbols has a technical meaning that relates to a cognitive process and identifies a specific intention of text. The second kind of symbols facilitates the interaction between sender and receiver. These symbols—called turn-taking symbols—enable senders and receivers to interpret text more explicitly, and they also indicate immediately when, how, and why the sender wants the receiver to interact. These symbols can be used to direct the turn-taking among senders and receivers of a message, much as a composer uses notation in a composition to direct actions on orchestra members. In order to be able to attribute the right meaning to each of the symbols and signals, any user will need to be trained in cognitive-self awareness, which

basically means recognizing what he/she does all the time and being able to match it with the symbols and signals, in the same way that intonation may be represented by the punctuation system.

The whole CPP-TRS system is based on the concept that you can enhance communication by visually perceiving text. The starting point is a global planning and organization of the text, and the ending point is the actual language of the text. This approach is grounded soundly in cognitive research that tries to understand the complexities of how our mind apprehends, processes, and communicates knowledge. The CPP-TRS approach is consistent with theories such as Marvin Minsky's Society of Mind, which contends that many specific cognitive processes occur in our minds before we formulate the actual language of a text. The serious difficulties we encounter organizing a text more often than not are the result of cognitive, not just linguistic, problems.

CPP-TRS directs the user toward starting from a global perspective, reflecting on the intention and function of each text. What is first provided is a set of "canvases", which are visual stimuli and global representations of communicative actions. Canvases are visual schemes that describe various communicative processes themselves, and they are navigation tools to guide the user through the complexities of transmitting knowledge verbally.

Once the user has got a global view of what and how he/she is trying to communicate, he/she can then proceed to a more detailed structuring of text. For this CPP-TRS provides visual signs and symbols.

Signs are visual conventions that represent general types of text. Does, for example, the text give an explanation, or does it summarize something? Does it convey a general concept or is it offered as a comment?

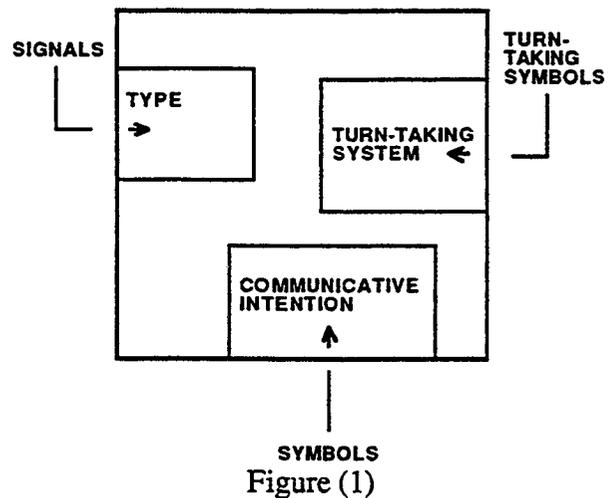
Symbols, on the other hand, have to do with communicative intentions. Is the sender defining something for the receiver or simply describing it? Is the sender trying to explain

something or just telling how he/she feels about it?

There are also symbols that facilitate a dialog between the sender and the receiver and they are called "turn-taking" symbols. These symbols explicitly note when the sender wants the receiver to contribute his or her knowledge in developing the text or where the sender is confident that the receiver should just process the text.

CPP-TRS is based on visual aids of canvases, signs, and symbols which are immediate, unambiguous, and consistent, and they can be used in combination.

CPP-TRS starts from a global perspective, reflecting visually on the communicative intention and function of a message (type) as well as the role the receiver should play by getting and returning the message, as it is shown in figure (1).



The CPP-TRS approach differs radically from the traditional approach to organizing text that assumes we create meaning and intention by first stringing together words and sentences.

In CPP-TRS there is no such thing as just language organization and writing, where words and sentence flow out of the mind of the writer and automatically and unambiguously convey his or her exact intention and meaning

to the receiver. There is rather a process of communicative labeling that makes transparent the aspects of language that are most difficult to grasp.

Language is actually very complex by itself. For example, it is very difficult to represent that process of understanding which goes from the sentence "It's cold in here. The window is open." to the message "Please close the window." There is no evidence whatsoever for it in the language itself. There is simply no direct link between the words, their meaning, and the sender's intention. This is the kind of ambiguity we find many times in producing and receiving messages, just because it is implicit in language.

In a CPP-TRS perspective the traditional process of creating a message has been reversed. Instead of starting with words, the sender must first understand his/her own intention, next design the structure of the text, and then finally select the words for it. This approach avoids the pitfalls of the traditional approach by making communicative intentions explicit at the very beginning.

The CPP-TRS system thus will support the user with the set of visual tools, shown in figure (2), that are specifically suited to structuring text and communicating effectively.

VISUAL TEXT PERCEPTION

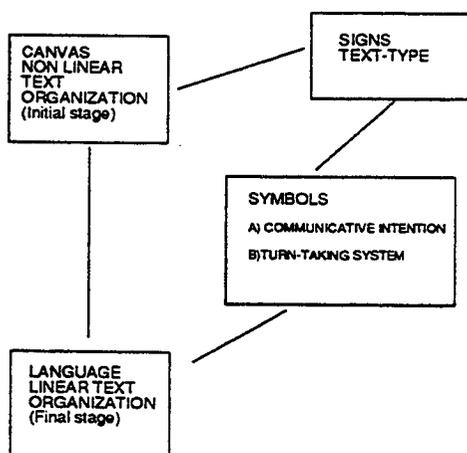


Figure (2)

The same tools can support oral communication very effectively in situations where ambiguity can highly compromise the final result. Air flight control environments are a very well-suited example of such applications.

The system may be used in a way that is either non-transparent or transparent to the reader of the text. The transparent use of the CPP-TRS® system has the visual representation of signs and symbols in the text so that they can be read by the receiver as a visual language complementing natural language. The visual language explicitly conveys those aspects of the text which are implicit and not conveyed linguistically.

More specifically, signs are visual conventions, much as traffic signs. Once they are understood they are easily apprehended, but in themselves they carry little evidence of their meaning.

Symbols are also visual conventions, but they visually carry something about their precise meaning so as to reinforce an awareness of the communicative intentions they represent.

Signs and symbols specifically convey aspects of written communication that cannot be carried by language itself.

Let's now have a look at some CPP-TRS symbols.

There are two kinds of visual symbols: text-style symbols and turn-taking symbols.

Text-style symbols are specifically aimed toward characterizing the style or type of text. The text-style symbols are:



Describe (from Latin word "describo", which means to write about or write around) stays for

Organizing information in a free and unconstrained manner. The sender is allowed to provide as much or as little information as he/she chooses without following any logical or chronological order.

 Define (from the Latin word "definio", which means to put limits on) stays for Organizing information by restricting it to a selection of relevant information.

 Explain (from the Latin word "explano", which means to unwrap or open up) stays for Organizing information by presenting facts in a cause and effect order. It is possible to start from the original cause and move downward progressively to a set of effects or, alternatively, proceed from the effects and move upward toward the original cause.

Other text-style symbols are:

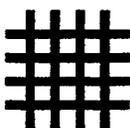
narrate
point out
regress
reformulate
synthesize
analyze
express.

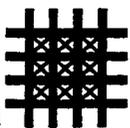
They are designed so that they intuitively convey the intention of the text they are associated with.

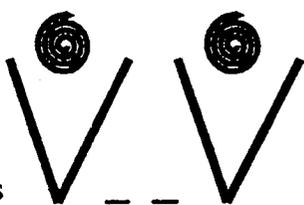
The turn-taking symbols are the following:

 Major scale
This symbol signals readers that what follows should be read exactly as written.

 Minor scale
This symbol invites readers to modify the marked off portion of the text.

 Open or unsaturated rhythm
This symbol indicates to readers that the writer considers the text to be incomplete. It invites readers to get into that portion of text and add more information if they can.

 Tight or saturated rhythm
This symbol indicates to readers that the writer considers the text as complete.

 Vee-like insertions
The insertion symbols are used in combination with the text-style symbols to explicitly identify the style of text. For example, when used in combination with the describe symbol, they indicate to readers that the portion of text between them is a description.

As it has been illustrated, the CPP-TRS system is aimed toward providing the user with a set of tools for structuring text and communicating effectively. The user can use the system in a way that is either non-transparent or transparent to the reader of the text. When used non-transparently a writer trained in the system uses visual tools to structure and organize a normal text. The text looks like any normal text to the reader and the reader is not aware and can't see the visual tools the writer used in creating it.

The transparent use of CPP-TRS system on the other side leaves the visual of signs and symbols in the text so that they can be read by the reader as a visual language. The transparent use presupposes that both the sender and receiver have learned the system. A few hours of user training will allow any user to speed up and control any communication process, which may either initiate or respond to.

Conclusions

CPP-TRS is a new paradigm. Numerous contributions made by scholars on iconic language have not been quoted or referred to because the CPP-TRS approach is radically different.

Icons in CPP-TRS are not intended to represent words or sentences as a way to substitute them as in some kind of esperanto as computer-based iconic language research is trying to do; they are rather intended to control different languages at a metalevel.

There are aspects of natural language which icons could never convey or would have problems conveying — one of those many is aspect and time. As the Author of CPP-TRS methodology I took another way: representing visually what natural language does not convey naturally. This is what CPP-TRS icons are designed for.

References

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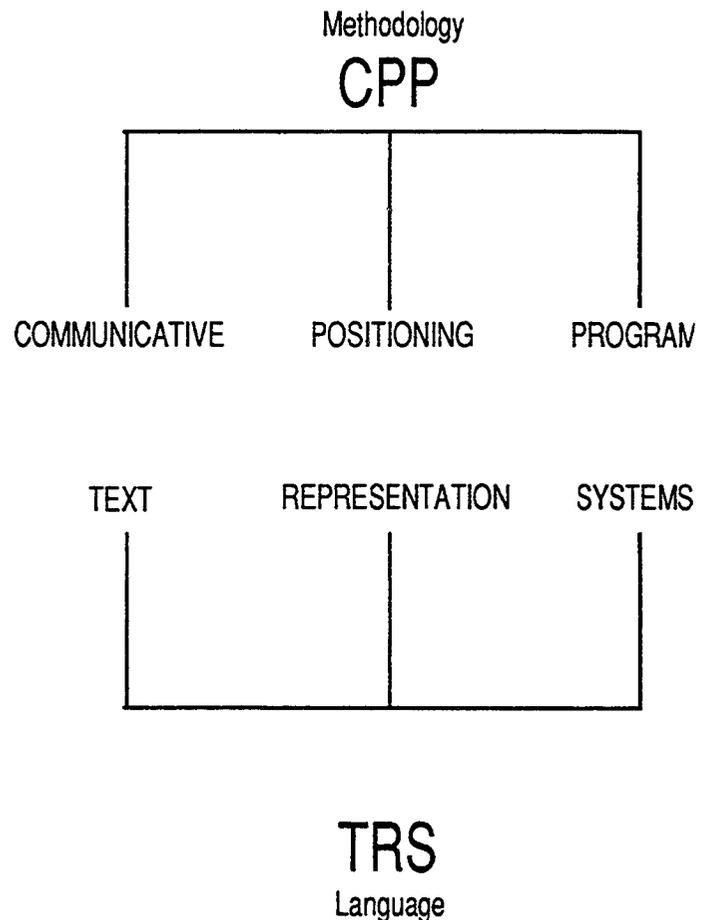
Tonfoni, Graziella (with James Richardson), *Writing as A Visual Art*, Intellect, Oxford, 1994.
(and with a Foreword by Marvin Minsky).

Appendix

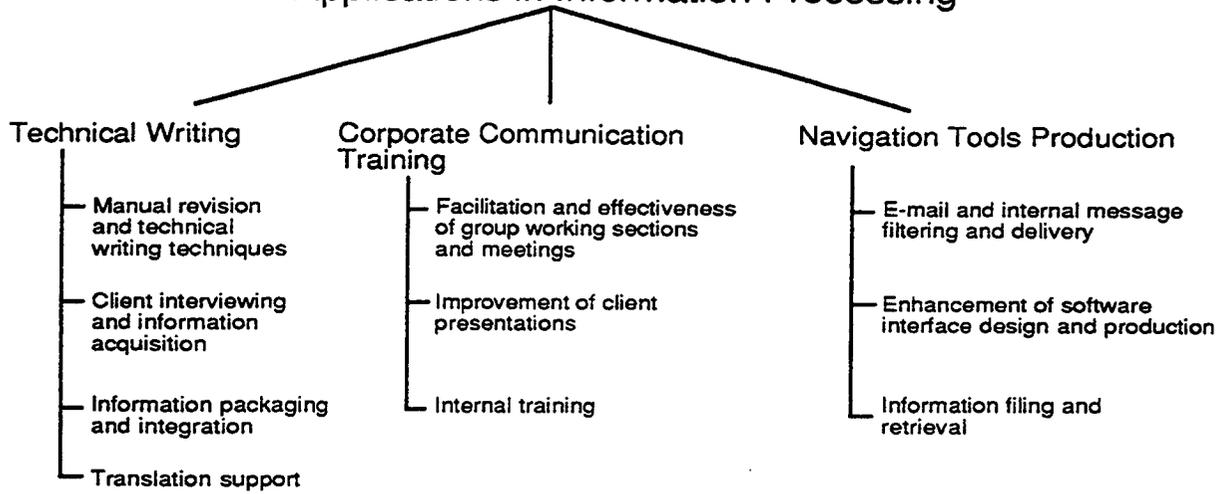
CPP-TRS© is both a methodology and a language. Through the methodology (CPP) those invisible aspects of communication are identified and represented by the meta-language (TRS), which complements natural language.

As a language by itself, CPP-TRS© can be applied to a variety of different fields. Here are some applications.

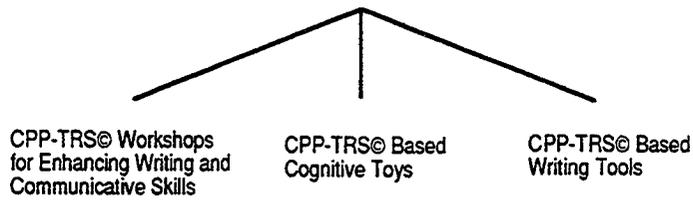
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